Conference on Business Management 2017
School of Business Management, Universiti Utara Malaysia, 06010 Sintok, Kedah, Malaysia,

A Preliminary Survey of TQM Knowledge and Case Study Findings Analysis among OSH Profession Community in Malaysia

Kang Eng Thye [a], Rajoo Ramanchandram [b] and Mohd Rushdi Idrus [c]

[a]School of Computing, Universiti Utara Malaysia, Malaysia
Email: kang1178@uum.edu.my
[b] School of Business Management, Universiti Utara Malaysia, Malaysia,
Email: rajoo@uum.edu.my
[c]School of Computing, Universiti Utara Malaysia, Malaysia
Email: rushdi@uum.edu.my

Abstract

The Total Quality Management (TQM) principles can widely be seen in most audit assessment frameworks such as the ISO Quality, Environmental and OSHAS 18001 as well as the ILO's OSHMS. Nevertheless, there is a negative report by The International Labour Organization's Caribbean Office and Multidisciplinary Advisory Team about the misuse of TQM concept by individual and organization that contradicts the original TQM teaching in the Occupational Safety and Health (OSH) context. The purpose of this study is to identify the level of understanding of TQM knowledge among OSH professionals in Malaysia. Apart from that, this study is also conducted to identify whether auditors are able to come to a same conclusion based on a case study given. The results show that 101 (91.8%) respondent agreed that TQM principles is important to strengthen the OSH management performance. However, all of the respondents failed to identify correctly the name of Deming's book and his core teachings. The case study results implied that there are differences of opinions among OSH professionals. Such results put a suspicious light on the effectiveness of audit findings and their validity in helping to improve the OSH performance.

Keywords: TQM, Deming, OSH, Case Study

INTRODUCTION

The audit process plays an important role to ensure that the quality principles are effectively implemented in organizations. However, the real state of TQM principles knowledge among local consultants, auditors, academician and industry practitioners is still unknown to most of us. As such, a simple survey with regard to the TQM knowledge among OSH community in Malaysia is important to help improve and strengthen the OSH management. Such a survey is also hoped to provide a clearer picture about the negative reports provided by the International body such as ILO.

LITERATURE REVIEW

If done in an effective and proper manner, the audit and inspection assessments can help to identify any deficiency or gap in current practice in meeting requirements. Improvement could be taken to overcome the limitation. Blotzer (2001:11) commented that "audit is a very critical component of any good safety and health program". However, some authors commented that the "continuous improvement" concept should replace the "safety audit" paradigm, and some even commented that "inspection is actually plan for detection", as commented by Beauregard et al. (1992:53).

According to Pybus R. (1996) and Kingdom Management Training (2003), the OSHMS was designed based on the TQM as the main management principles. The International Labour Organization's Caribbean Office and Multidisciplinary Advisory Team (1997:1) criticized that the TQM concept was "abused by individual and organization" structure "without any similarities with those described by the concept."

Lastly, some quality gurus like Deming criticized that inspection is too late and too costly to detect any problems. He added that most deficiencies will never be discovered through inspection itself (Latzko and Saunders, 1995). His view is also supported by studies (Kang, E. T. and Kang, C. M., (2016); Kang, E. T. et. al (2004a) and Kang, E. T. et. al, 2004b)) showing that effectiveness and efficiency of the audit and inspection activities are highly suspicious.

PURPOSE OF THIS STUDY

This study aims to achieve a few objectives, which are:

- To identify the level of knowledge of TQM principles among Malaysian OSH professionals.
- To identify the OSH practitioners and professionals comment towards the same case study finding.

RESEARCH METHODOLOGY

A simple perception survey was conducted at 7th NIOSH National Conference and Exhibition on Occupational Safety and Health (COSH2004) on 20-21 July 2004 at Sunway Pyramid Convention & Exhibition Centre, Kuala Lumpur. Convenience sampling was used to distribute the questionnaire to the 800 participants who was attending the conference. A case study that was selected from the Kwang Hwa Press dated 17 Dec 2003, Wednesday on page B9, was included in the survey form. Only 119 (10%) samples were collected from the 830 questionnaires that were distributed. This means that a big number of the participants are taking a very passive role with the TQM principles matters.

DATA ANALYSIS

Table 1: Respondents' Professional Title

Job Title	Frequency	Percentage %
Consultant	1	0.8
Auditor	7	5.9
Academician	6	5.0
Industries' Supervisor, Line leader and Operator	6	5.0
Industries' manager and executive	30	25.2
Government's Officer	8	6.7
Safety and health officer/manager	58	48.7
Others (pilot)	1	0.8
Missing value	2	1.7
	119	100%

The Table 1 shows that a total of 119 respondents were interested in this study. The data show that the highest number of respondents are Safety and Health Officer/Manager, followed by the Industries' manager and executive with 58 (48.7%) and 30 (25.2%) respectively. Nevertheless, it is expected that the professional group such as consultant, auditors, academician show the lowest respond level in this study.

Table 2: The various professionals' perception towards important of TQM principles in strengthening the OSH performance

Job title	Yes	No	No Idea	Total
Consultant	1			1
Auditor	5		1	6
Academician	5	1		6
Industries' Supervisor, Line leader and Operator	5			5
Industries' manager and executive	28	1		29
Government's Officer	7	1		8
Safety and health officer/manager	50	3		53
Total	101 (91.8%)	6 (5.5%)	3 (2.7%)	110 (100%)

Table 2 shows that 91.8% of the respondents generally agreed that TQM principles is an important management theory to improve the OSH management issue. Only a handful of them (5.5%) claim that TQM principles do not improve the OSH management performance. Finally, 3 respondents have no idea about the TQM principles. Meaning to say, in general, the OSH community do accept TQM principle is important for strengthening the OSH management.

Table 3: The various professionals' knowledge of Three Famous Quality Gurus Teaching

Job title	Juran	Philip Crosby	Deming
Consultant	1		
Auditor			4
Academician	3	1	6
Industries' Supervisor, Line leader and Operator	2		1
Industries' manager and executive	2	1	12
Government's Officer	1	2	4
Safety and health officer/manager	8	10	20
Total	17 (14.3%)	14 (11.8%)	48 (40.3%)

We can see Deming is the most identified guru with 48 respondents (40.3%) of the total 119 respondents. He is followed by Juran and Crosby with 17 and 14 respondents respectively. Besides that, some respondents replied that they also aware of Ishikawa teaching that account for 3 respondents (Q3), (Q23) & (Q50). Other respondents also mentioned about "Ford", "NPC and Sirim "(Q87), "I.S.M. – for ships" (Q45), etc.

Table 4: The various professionals' perception about Deming books that they are familiar with

Job title	Yes	No	Total
Consultant			1
Auditor	1		6
Academician	3	1	5
Industries' Supervisor, Line leader and Operator			4
Industries' manager and executive	4	1	27
Government's Officer	1	1	6
Safety and health officer / manager	10	3	48
Total	19 (19.6%)	78 (80.4%)	97 (100%)

Despite a large number of the respondents being able to identify Demings as a quality guru, it is very surprising that 78 respondents or 80.4% from total 97 valid respondents do not have any idea about

the books written by Deming. We further analyze that from the 19 respondents who said "yes", 9 didn't mentioned anything (Q7),(Q25),(Q42),(Q53),(Q68),(Q75),(Q76),(Q82),(Q93); 5 respondents answered but gave wrong answers such as "Deming's 14 Quality Principles" (Q6); "Customer satisfaction" (Q57); "behavior mgt, TQM in car manufacturing" (Q90); "Deming Design of Experiment" (Q112), "toward better implementation of Occupational safety and health" (Q116) and lastly 5 respondents mentioned they forgotten (Q50), (Q51), (Q72), (Q86); (Q103). It shows that most of the OSH community actually know nothing about Deming's teaching. They only learn about Deming's name from the PDCA model as mentioned in most ISO management system model.

Table 5: The various professionals' familiarity about Deming's teaching or theories

Job title	Yes	No	Total
Consultant			
Auditor		2	2
Academician	1		1
Industries' Supervisor, Line leader and Operator		3	3
Industries' manager and executive	3	10	13
Government's Officer	1		1
Safety and health officer / manager	9	12	21
Total	14	27	41
	(34.1%)	(65.9%)	(100%)

Only 41 respondents answered the question of whether they are familiar with Deming's principles and theories. Out of the 41 respondents, 14 of them answered "Yes" and 27 answered "No". However, 9 out of the 14 respondents gave the wrong answer such as "Always use the Plan-Do-Check-Act Approach" (Q6), "free quality is built in, not get-in" (Q7), "build quality in process to minimize 'rejection' (Q50), "quality is a continuous process" (Q51); "Delight the customer" (Q57); "Deming wheel PDCA" (Q76); "Plan-Do-Check-Act Approach" (Q82); "Concurrent engineering, JIT philosophy" (Q90); "PDCA" (Q93); "understand prob (obtaining data to support), analyze it and proposed solution" (Q112). On the other hand, the balance of 5 respondents did not mentioned anything. We can see that the respondents were not able to give the right theory despite them claiming that they have read Deming's book.

Table 6: The various professionals' comments towards the case study findings with the Airline top management disciplinary action towards the pilot crews

Job title	Yes, Agreed	No Agreed	No Idea	Total
Consultant		1		1
Auditor	2		2	4
Academician	1	3		4
Industries' Supervisor, Line leader and Operator		2	3	5
Industries' manager and executive	15	7	1	23
Government's Officer	3	3	2	8
Safety and health officer/manager	31	10	2	43
Others	1			1
Total	53	26	10	89
	(59.6%)	(29.2%)	(11.2%)	(100%)

The above tables shows that there were only 89 valid respondents for this question. 59.6% of respondents agreed with the airline top management disciplinary action against the crews. Whereas, 26 (29.2%) of respondents do not agree with that. Finally, 10 (11.2%) of the respondents do not have any

comment about the case study. Basically, almost 60% of the respondents agreed with the top management's disciplinary action against the crews.

We further analyze the reasons that was given by most of the respondents that agreed with the top management action against with the crews as shown in Table 7. There are two main theme of reasons which I have classified as "crews are responsible" and "as a remind to other crews". Whereas, four respondents reply "yes", but did not give any comment (Q40); (Q97), (Q98) & (Q108).

Table 7: Respondents' reasons that agreed on top management's disciplinary action against the crews

Themes	Reasons
Crews are responsible	Captain & co-pilot are the qualified personnel to handle the aircraft. They are totally responsible for the safety of flight (Q1) SOP checklist would detect such error of weight for aircraft trimming. Aircraft captain and recorded crews has to be accountable (Q4) The captain should have the acquired competence to ensure that a basic requirement for safe take-off is double-checked" (Q6) I assume the weight should be calculated by co-pilot manually (Q7) We can't compromise on safety. Life's would have been lost due to the negligence of the pilot/co-pilot (Q9) It is crime for not reporting correct weight (Q10) A/C captain hold the responsible on the overall operation of the vehicle (Q11) As the captain of the aircraft, he has the ultimate responsibility to ensure the safety of his passengers and aircraft. (Q13) Safety First!! The pilot should have checked all safety measures/item before departure (Q14) The competency of both pilot is questionable as the basic rule of safety is not follow as it can lead to major disaster (Q19) As a captain he should be hold responsible (Q20) If we talk about safety and health, both of them should be terminated. The incident happened because of misreport (Q22) Safety of the passengers and the credibility of the airline depended on the aircraft crews to follow strictly to operating procedures. (Q25) Seems like the co-pilot is more concerned on the late departure than the safe take off of the aircraft (Q26) Capt's responsibility to verify basic flight info. Carelessness lead to property damage, possible injury and possible deaths. (Q27) The captain is pilot-in-command of the aircraft. (Q28) Pilots have heavy responsibility making sure passengers safety well taken care of. No compromise for this "serious" mistake. (Q31) Kerana ianya menjadi tanggungjawab setiap kapten dan co-pilot untuk membuat pemeriksaan mengikut checklist yang disediakan. Pihak pengurusan juga perlu menyediakan satu sistem yang sesuai bagi menghalang ianya dari berulang/berlaku kembali. (Q33) The captain is responsible to the aircraft. He should refer to the flight checklist before takeoff. (Q36) The captain is responsible for all on board the A/C. (Q43) Not competent as he could not detect the inaccuracy (Q45)

	When u deal with high-tech equipment, the extent or actual figure on the weight is very-very important. The pilot, co-pilot should know about this and realize the effect of that if they give a wrong figure. So clearly the captain is failure. (Q46) It appeared element of negligence on the part of the pilot for his failure. (Q50) Basic info for operating aero plane has to be communicate between pilot and control tower. Mistake is not permissible in such a high risk operation; else serious accident is inevitable. (Q57) Because the pilot and his co-pilot careless can make people die. They must get a punishment but not just fire them up. The action taken is fair enough to them. (Q58) Running an aircraft is not an easy business. The pilot and his team needs to be meticulous to make sure the safety of their passengers. (Q60) To my opinion, the pilot (captain) make one unsafe act and cause the accident. He should be punishing. (Q62) Although the co-pilot has misreported the a/c weight, but as a captain of the a/c, the pilot has responsible to make sure by checking the correct weight before taking off. (Q66) The captain is accountable for the management of the aircraft. (Q71) The captain or pilot is fully responsibility. (Q73) It is his responsibility to check and he need to check (active) as opposed to checking at the desk (Q76) The captain and pilot should be more responsibility in reporting (Q78) It is his/her job. (Q80) It's the role and responsibility of the captain and co-pilot to ensure the safe taking-off of the airplane. (Q82) Captain and co-pilot not do their job correctly and not alert for major cause/major item to be check for the aircraft (Q84) In fact, the pilot should be terminated immediately. The behavior reflected by the pilot and his co-pilot endangered the lifes of 389 people. (Q85) Not comply with standard operating procedure. (Q86) If management has given enough training/info procedure, etc as stated in the laws – but pilot failed to comply (Q89) Procedures have been set to report the exact weight. By not doing so, the pilot has violated the procedure. This, it is understandable as to the disciplinary action. (Q91) This case is the human error. (Q93) Because the minor mistake made by pilot or co-pilot may cause a fatality. (Q103) It is bogged down to the bad attitude of not following the standard guideline for aircraft safety which is stringent. I believed all of them (pilot and co-pilot) have attended training and passed the competency test. Failure to comply shall be punished. (Q112) This shows that the captain and his co-pilot commence negligence while carrying not their duties. They were not aware of the responsibilities and the inaccuracy of information would cause fatality. (Q113) Everyone must be responsible of action at workplace. (Q118) Aircraft take off speed is the most crucial element and failure to check is indeed intolerable. I partially agreed with the top management decision except that the consequence on the captain, co-pilot and assistant pilot should be similar. (Q119)
As a good remind to other crews	To teach other pilots on how serious a small mistake can risk the people life, property, money and reputation of the aircraft company. (Q44)

We then further analyze the reasons given by respondents who do not agree with the top management's disciplinary action. 9 main themes were classified as shown in Table 8 below. However, there were 3 respondents that did not state any comment (Q42), (Q67) & (Q77).

Table 8: Respondents' reasons that do not agree on top management's disciplinary action against the crews

Themes	Reasons
Do not study the real root cause	Not looking in detail system cause. The investigation in the early stage pin pointing pilot & co-pilot as main error. This lead investigation analysis on why & how pilot make that mistaken/error. The other factor is to protect company image if system errors were the main causes. (Q2) Proper in-depth investigation should be carried out to get to the root of the problems before any decision to be made. (Q72) No evidence on training and retraining. Who verify the weight scale reading is accurate? (Q96)
More crews such as ground crew should be also responsible	Action taken on Captain is not right. Both captain and co-pilot and ground staff should be disciplined. Proper investigation like wind speed, QNIT, temperature, wind direction should be considered, including weight distribution of aircraft. The co-pilot and captain cannot be responsible for ground crew to under declare the total cargo weight. But, however, the contributory factor is weightage factor. Nevertheless, the pilot must be competent with technical emergency recovery response and abort take off before reaching at the end of runway when pilot knows the performance of the aircraft. (Q8)
Everybody is responsible	They neglected the basic philosophy of safety, that is safety is the responsibility of all, and not just the pilot to be blamed (Q15)
Technical / system fault	Since the problem is in the transfer of information, a system should be available to the control tower to check the data i.e. plane should be passing in a weight scale on its way to runway. Since the info is vital, a safe system must be available. (Q16) Capts were operating base on inaccurate data/feedback. He checked and found nothing. The co-pilot negligence is the cause of the case. The system of checking before takeoff is quite doubtful. It's a failure of man and system. Review the system before punishing the captain. (Q47) This is a system failure rather than the individual (Q56) The TOW (Takeoff Weight) of the a/craft must be confirmed both the cockpit crew and load sheet officer. Is not the sole pilot mistake. (Q101) The responsibility may not fault by airport captain. (Q109)
The crews has done their best	The pilot has acted in good-faith on all information provided to him. There is no way for him to know that these weight was not correctly noted though he checked the aircraft. (Q17)
Depend on whose responsible	The pilot should be given heavier punishment if that unreporting case is part of his/their written procedure prior to take off (Q23) Of course the pilot as a captain of the a/c has full responsibility of his discretion but in technical matter, the one who should be taken disciplinary action is the co-pilot. The co-pilot is there to assist the pilot. (Q29)
Punishment do not improve anything	Stripping titles does not guarantee attitude change and responsibility (Q30)

Fault of top management itself	May be the top management failed to train the co-pilot and captain and before takeoff they should have checklist before missing any things. The management failed to implement the safety here. (Q32) There is no line responsibility with regards to safety relating to aircraft weight reporting. Also no procedure and supervision in place. This has to come from the top management. The pilot in this case is only a 'worker' (Q34) Proper procedure and SOP should be streamed down. Better cause and effect analysis should be done by the management where finally will show that the actual source of problem comes from management. (Q38) The management should also take responsibility. The pilot made decision based on the wrong input, the management should ensure co-pilot was really trained until he was really competent. (Q51) Need to do "audit" before the plane taking off and landing. (Plan, do, check and finally action). Airline management should have enough data before allow passenger and luggage to board into the type and capacity of planes (Q68) Lack of management control (Q89) Is there any safety briefing or safety course conducted, if no, it means the management fail in his duty of care. (Q90)
More severe punishment to pilot	The pilot should be grounded for a short period (3-6 months), training and make use of his past behavior to teach others. (Q52)

Finally, we look into the respondents that do not give any comment and their reasons as shown in Table 9. Three respondents said it need further study and investigation. One respondents claim said not fair to give any comment (Q65). Whereas, 6 respondents did not mention any reason (Q41), (Q59); (Q88); (Q94); (Q95); (Q99).

Table 9: Respondents reasons that give no comment about this case study

Themes	Reasons
Need further investigation	We need to look at all possible cause. The given text alone is insufficient to conclude anything (Q24) It is important what is the depth of investigation and how they have considered the possibilities of human errors than can happen (Q37) Further investigation is needed. (Q106)

There were some respondents whose handwritings were not readable and understantable (Q39); (Q87) & (Q102).

DISCUSSION

- Zero knowledge of TQM principle among OSH practitioners

The findings of this simple survey paints a very bad picture on the quality level of OSH management, consultancy and audit activities that has been carried out in Malaysia since the enforcement of Malaysia's OSHA Act in 1994.

Table 10: Summary of respondents' knowledge about TQM and case study findings

Question	Criteria	% Sample	Samples	Answer
TQM is important to enhance OSH management	Yes	101 (91.8%)	110	
	No	6 (5.5%)		
	No Idea	3 (2.7%)		
Familiar of quality Guru	Juran	17 (14.3%)	119	
	Philip Crosby	14 (11.8%)		
	Deming	48 (40.3%)		
Deming's book that they know	Yes	19 (19.6%)	97	All answered wrongly the Deming's book name
	No	78 (80.4%)		
Deming's teaching	Yes	14 (34.1%)	41	All answered wrongly the Deming's theories
	No	27 (65.9%)		
Case study about top management disciplinary action on the crews	Yes, I agree	53 (59.6%)	89	
	No, I do not agree	26 (29.2%)		
	No idea	10 (11.2%)		

The Table 10 shows a summary of the current state of TQM knowledge among various OSH professionals and their case study findings comments. Despite many of the professionals claiming that TQM is important, they were not able to identify the important theories related to Deming's teachings.

From this sequence of investigation, we can come to a conclusion that most of the consultant, academician, auditors, industries practitioners actually "know nothing" about the TQM principles.

- Different opinions among OSH practitioners towards similar case study investigation

The case study findings show that 53 or 59.6% respondents agreed or supported the Airline top management's action against their crews. Whereas 26 or 29.2% respondents did not agree and 10 or 11.2% did not give any comment. We can come to a conclusion that it is never an easy task for auditor or consultant to determine what is the best solution to any problem. Meaning to say, the effectiveness of an audit activity is debatable. In other words, we can question the works done by most consultant, auditors, academician, industries' practitioners in their own respective business.

- The real credibility of OSH audit or inspection practice

This case study in this survey highlights that opinions on the same issues might differ tremendously from one professional to another. As such, the effectiveness of audit and inspection activities results that are carried out on the basis of OSHA Act 1994 and ISO Quality, Environmental and Safety and Health,

can be viewed in a suspicious manner. Can they really prevent accidents and poor quality defects from happening? As Deming (1992:388) quoted from minority report of the Joint Economic Committee, Wall Street Journal, 15 March 1977 that "The aim is admirable, but the method is madness."

CONCLUSION

The result of this survey shows that most of the OSH professionals do not have the comprehensive knowledge about TQM principles. They wrongly interpreted the element in the OSHMS management system with their own understanding without referring to the famous quality guru's own definition and explanation. As such, the local education institutions should play a more proactive role in educating the professionals.

REFERENCES

Beauregard, M.R., R.J. Mikulak and B.A. Olson. (1992). A Practical Guide to Statistical Quality Improvement. New York, NY: Van Nostrand Reinhold.

Blotzer, M.J. (2001). PDA software offers auditing advances. Cleveland: Occupational Hazards, 63: 11-12.

Deming, W.E. (1992). Out of Crisis. Cambridge: The MIT Press.

International Labour Organization (ILO) Caribbean Office and Multidisciplinary Advisory Team. (1997). Handbook for Joint Safety and Health Committees in the English-speaking Caribbean: Total Quality Management and Occupational Safety and Health. http://www.ilocarib.org.tt/infsources/osh_handbook/tqm.html (Access: Oct 2003)

Kang, E. T. and Kang, C. M. (2016). *"F" Character Experiment: Simulation Test on Audit and Inspection Concept Effectiveness and Efficiency*. World Applied Sciences Journal, ISBN:1818-4952, Vol. 34, No. 12, 1805-1810, DOI: 10.5829/idosi.wasj.2016.1805.1810

Kang, E. T., Syed Al Junid and Rampal, K.G. (2004a). *A Review of International Developments in Occupational Safety and Health Auditing Practices*. Journal of Community Health, ISBN: 1675-1663, Vol.10, 65-72.

Kang, E. T., Syed Al Junid and Rampal, K.G. (2004b). *Strengths and Weaknesses on Occupational Safety and Health's Audit System in a Manufacturing Plant in Selangor*. Journal of Community Health, ISBN: 1675-1663, Vol.10, 73-82.

Kingdom Management Training. 2003. The Principles of Safety Health and Environmental (SHE) Management. http://www.personal.u-net.com/~kmt/pdf/hsd.pdf (Access: Oct 2003)

Kwang Hwa Jit Poh. (2003). Kaptain Singapore letak jawatan: kurang lapor keberatan berat kapal terbang dikenakan tindakan disciplin. (In Press)

Latzko, W.J. and D.M. Saunders. (1995). Four Days with Dr. Deming: A Strategy for Modern Methods of Management. Reading: Addison-Wesley.

Pybus R. (1996). Safety Management Strategy and practice. Oxford: Butterworth Heinemann.